
TORONTO
VS.
LONDON

# Neighbourhoods classification

Grouping neighbourhoods of Toronto and London based on crime rates and venues category is important to security and surveillance companies when formulating their approach to customers

Landlords can improve the security and surveillance in their respective areas thus increasing the demand for their housing

Inhabitants of the high rate criminality areas can take extra measures in assuring their safety

Community benefits from the increased level of surveillance, easier identification of perpetrators that leads to faster apprehension

Law enforcement agencies get access to footage that caught ongoing crimes, ensuring faster convictions

# Data acquisition

- Toronto crime dataset was downloaded from https://data.torontopolice.on.ca/datasets/
- London crime dataset was downloaded from https://data.london.gov.uk/dataset/
- Toronto crime dataset was downloaded from https://en.wikipedia.org/wiki/List_of_neighbourhoods_in_Toronto
- London crime dataset was downloaded from https://en.wikipedia.org/wiki/List_of_areas_of_London

# Data cleaning

- The Toronto data is made out of 138 neighbourhoods after the processing and cleaning. Neighbourhoods that had missing crime numbers or no borough assigned were removed

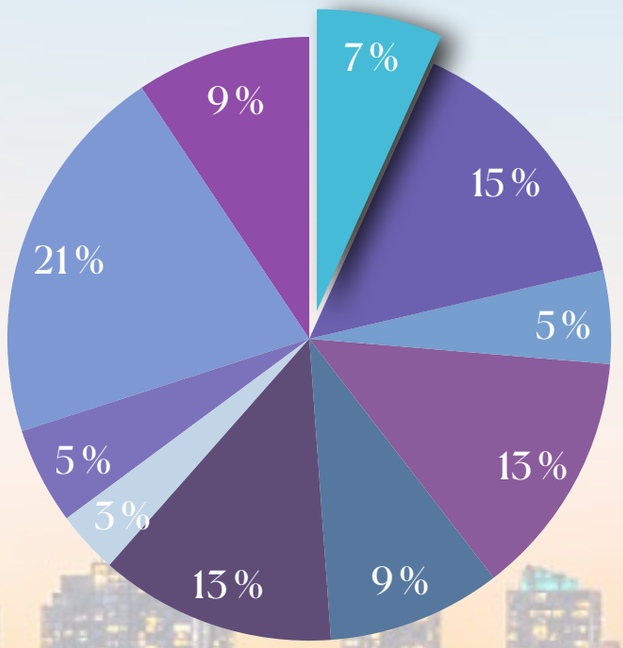
- The London data has 260 neighbourhoods after selecting only the boroughs that are in metropolitan London. Neighbourhoods that had exactly the same coordinates were removed, but one that was afterwards assigned the sum of crimes from all the deleted neighbourhoods with the same coordinates

- Foursquare category IDs were used to find the total number of the specific type of venue for each neighbourhood

- All the venue counts and the total crimes per neighbourhood were normalised for more accurate results in the clustering

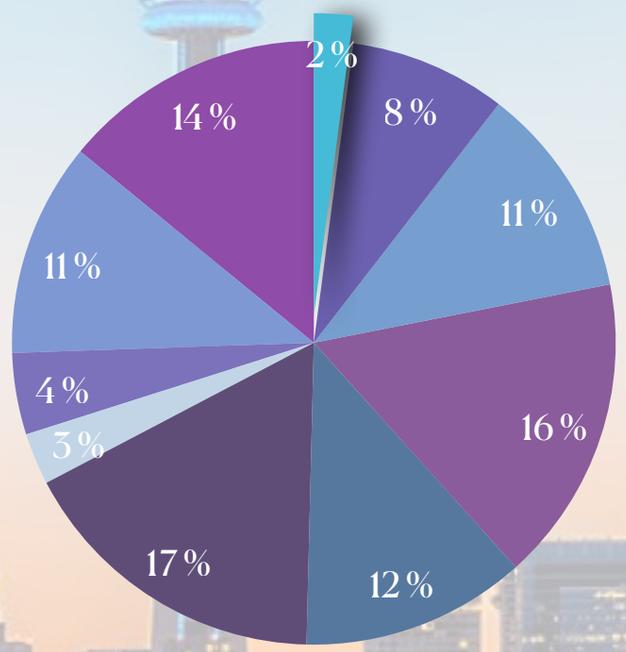
# K-means Clustering Results

### Toronto cluster "0"




- Crimes Reported
- Arts&Entertainment Venues
- Colleges
- Restaurants
- Night Life Venues
- Outdoors&Recreation Venues
- Government Buildings
- Medical Centers
- Spiritual Centers
- Grocery Shops

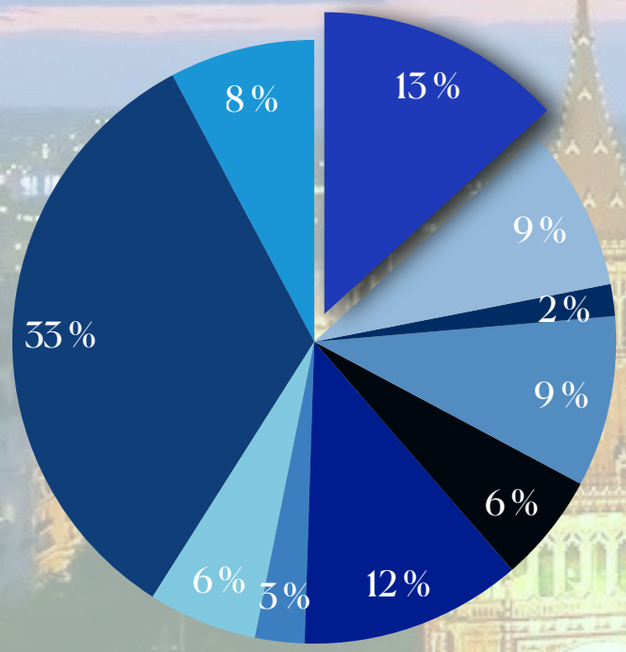
### London cluster "1"




**Based on the observation of the resulting clusters for both cities, Toronto's cluster "0" and London's cluster "1" are represented by neighbourhoods that are close to downtown areas. In these areas many recreational venues, restaurants and entertainment venues are found and significant number of night life venues.**

# K-means Clustering Results

## Toronto cluster “1”

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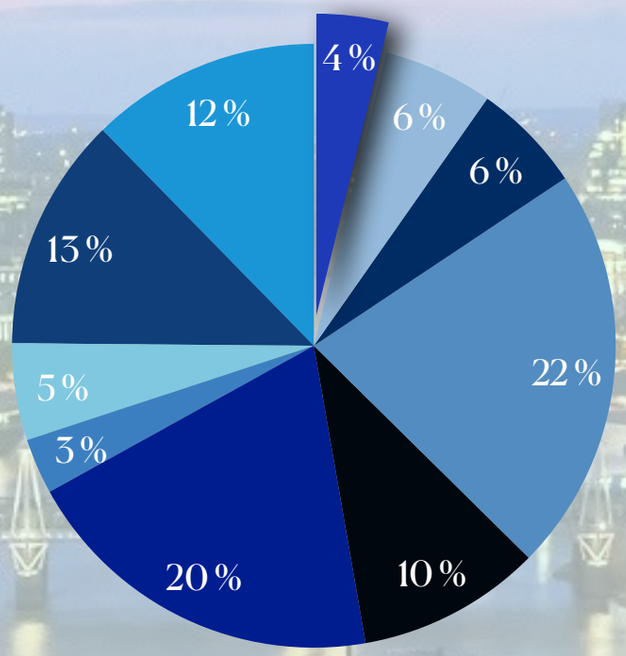
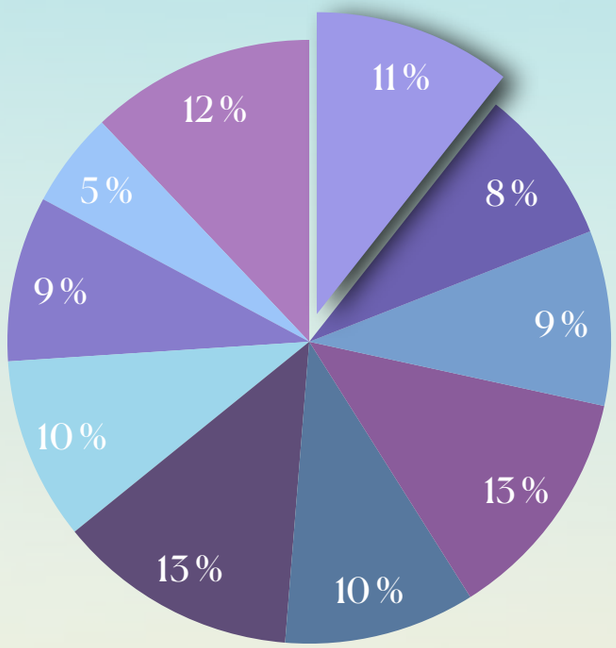
## London cluster “2”




**Toronto’s cluster “1” and London’s cluster “0” are represented by residential neighbourhoods and have average amounts of crimes registered. In these areas can be found many recreational venues and spiritual centres.**

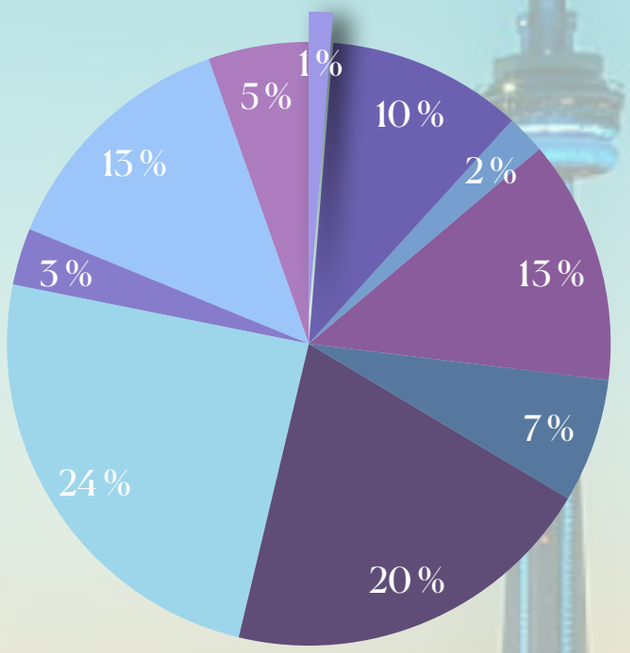
# K-means Clustering Results

## Toronto cluster “2”





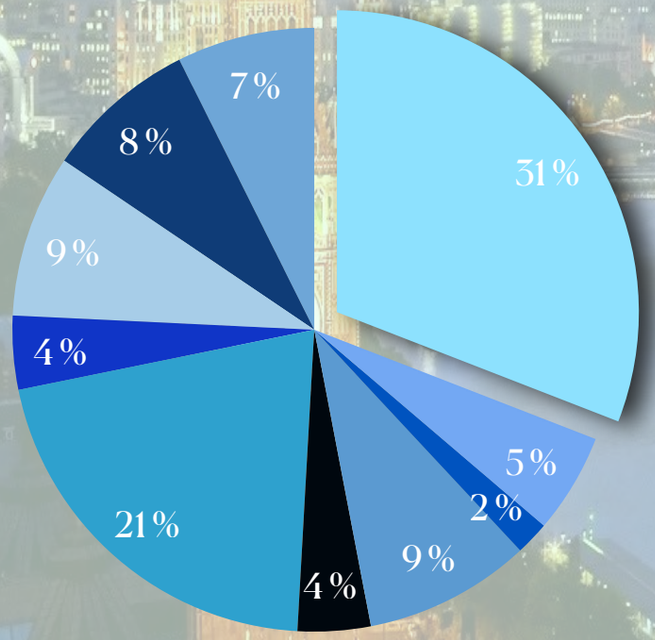
## London cluster “3”




**Cluster “2” of Toronto and cluster “3” of London are both represented by neighbourhoods that are in the city center. Crime rates are relatively low and the central location of the neighbourhoods is confirmed by the high amount of government buildings. These areas have many restaurants, recreational areas and night life venues.**

# K-means Clustering Results

## Toronto cluster “3”

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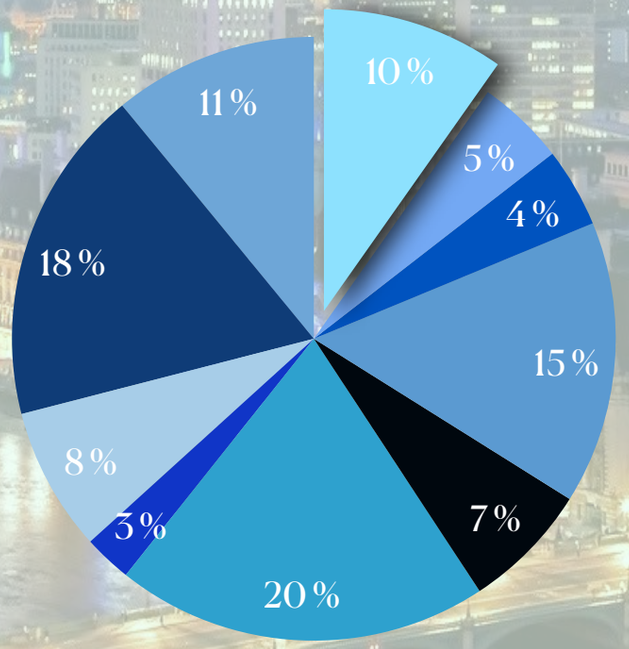
## London cluster “0”




**The resulting cluster “3” of Toronto and cluster “0” of London are residential neighbourhoods with very high number of crimes reported in comparison with the other residential neighbourhoods. In these areas are found many recreational venues and restaurants.**

# Conclusions & Observations

- The resulting clusters are based on the level of crimes and the location of the neighbourhoods. Downtown and city center neighbourhoods were divided into low crime and high crime rated. The same separation was made for the dense residential neighbourhoods.

- Even if the city of London is on average four times bigger than the city of Toronto, the latter is clearly more affected by criminal activities, which may be a result of the gun regulations in the belonging countries.

- Contrary to the assumptions made in the beginning, neighbourhoods that are in the city centers are not as affected by crime as the residential neighbourhoods.

- The analysis clearly shows that Toronto's cluster "3" and London's cluster "0" are being the most affected by crime. The inhabitants and landlords of these areas are the target customers for the security and surveillance companies. Further analysis can be conducted on the type of crimes that are more often reported in these areas and then formulating solutions that would improve the safety of these neighbourhoods.